REMARKS

Claims 6-8, 19-21, 23, 24, 26, 27, 30, and 32-35 are currently pending in the case. Further examination and reconsideration of the presently claimed application are respectfully requested.

Allowed Claims

Applicant appreciates the Patent Office's allowance of claims 6-8, 19-21, 23 and 24 and awaits formal allowance of the remaining claims.

Section 103 Rejections

Claims 26, 27, 30, 33, and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,245,652 to Gardner et al. (hereinafter "Gardner '652") in view of U.S. Patent No. 6,077,791 to DeTar (hereinafter "DeTar"). Claims 32 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner '652 in view of DeTar further in view of U.S. Patent Application Publication No. 2002/0142500 by Foglietti et al. (hereinafter "Foglietti"). To establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond,* 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). In addition, the cited art does not teach or suggest, and cannot be combined or modified to teach or suggest, all limitations of the remaining pending claims, some distinctive limitations of which are set forth in more detail below.

None of the cited art, taken alone or in combination, teaches or suggests the use of ozonated deuterium oxide. Claim 26 recites in part: "[a] method for processing a semiconductor topography, comprising: growing an oxide film upon the semiconductor topography in the presence of an ozonated substance comprising ozonated deuterium oxide ...." The Patent Office

acknowledges on page 3 of the Office Action that "Gardner et al. fail to disclose the required ozonated substance comprising deuterium oxide." To overcome such a lack of teaching, the Patent Office cites DeTar as disclosing a method for forming a passivation layer using an ozonated deuterium oxide substance, and states "... it would be obvious to include the required ozonated d[e]ionized water rinse in Gardner et al. as taught by DeTar in order to have a[n] oxide/dielectric/passivation layer with long term reliability ...." (page 3 of the Office Action). As set forth in more detail below, the Patent Office's interpretation of DeTar is respectfully traversed. In addition, the Patent Office's basis for combining the references to teach the limitations of claim 26 is respectfully traversed. In particular, the Patent Office's assertion that "it would be obvious to include the required ozonated d[e]ionized water rinse in Gardner et al. as taught by DeTar ..." is not substantiated. Neither Gardner '652 nor DeTar teach or suggest a rinsing cycle or the use of deionized water, much less ozonated deionized water.

The Patent Office cites column 2, lines 35-63; column 3 lines 50-67; and claim 1 of DeTar as disclosing the use of an ozonated deuterium oxide substance. As noted in the summary of such citations below, none of the citations teach or suggest the use of ozonated deuterium oxide as recited in claim 26.

DeTar -- column 2, lines 35-63:

This passage discloses the formation of passivation layer 20 including doped oxide film 22 approximately 4000 angstroms thick and nitride film 24 approximately 7000 angstroms thick. For forming the oxide film, this passage states a silicon source gas and an oxygen source gas are used. DeTar specifically teaches in the passage that the silicon source includes deuterated silane (SiD_4), deuterated disilane (Si_2D_6), or, in the case of an oxide film, deuterated TEOS ($SiO_4C_8D_{20}$). Although deuterated TEOS may be referred to as a deuterated oxide substance since it includes deuterium molecules and oxygen molecules, deuterated TEOS is **not** deuterium oxide, much less ozonated deuterium oxide. Claim 26 specifically recites growing an oxide film in the presence of an ozonated substance comprising ozonated deuterium oxide. As noted on page 13, lines 11-18 of the specification and as is well known in the art, deuterium oxide specifically refers to the chemical formula D_2O. Therefore, the teaching of deuterated TEOS in DeTar does not read on claim 26.

In addition to using a silicon source to form oxide film 22, DeTar teaches the use of an oxygen source to form the film. In particular, DeTar teaches that oxygen sources of "nitrous oxide, oxygen, ozone or the like ..." may be used (DeTar -- col. 2, lines 61-63) In reference to such a disclosure, DeTar unequivocally states that the oxygen sources "**do not include hydrogen**" (DeTar -- col. 2, lines 62-63 (emphasis added)). Since deuterium is an isotope of hydrogen, DeTar specifically teaches away from using a deuterated oxygen source to form oxide film 22, much less an oxygen source including ozonated deuterium oxide.

DeTar -- column 3, lines 50-67:

This passage discloses a sintering process to alloy first and second interconnect layers 112 and 118. DeTar teaches the process includes a sintering gas of "DH, molecular deuterium (D_2), [a] forming gas including DH or D_2, or the like" (DeTar -- col. 3, lines 56-58). Applicant respectfully submits that this cannot be read to include deuterium oxide. Rather, DeTar only recites variations of hydrogen and deuterium, mixed either together or with an inert gas in such a passage. Furthermore, DeTar does not teach that the sintering process forms an oxide layer. As such, even if, merely for the sake of argument, DeTar did somehow teach that the sintering process includes deuterium oxide, such a disclosure would not render one skilled in the art to use such a process for forming an oxide layer, and, thus, cannot be used to teach the limitations of claim 26.

DeTar -- claim 1:

Claim 1 of DeTar is directed to a process for forming a semiconductor device which includes exposing the semiconductor device to a sintering gas at an elevated temperature. Claim 1 specifies the sintering gas has a first deuterated gas concentration. Although claim 1 is broadly written to recite that "... the sintering gas has a first deuterated gas concentration," such a limitation cannot be read to include ozonated deuterium oxide, nor would it be obvious to one skilled in the art that such a recitation could include ozonated deuterium oxide, since **nowhere** in DeTar is the use of ozonated deuterium oxide taught or suggested. Furthermore, as noted above, even if, merely for the sake of argument, DeTar did somehow teach that the sintering process includes deuterium oxide, DeTar does not teach that the sintering process forms an oxide layer, and, consequently, one skilled in the art would not be motivated to use such a process for forming an oxide layer.

The process recited in claim 1 further includes reacting a first source gas and a second source gas to form an insulating layer. Claim 1 specifically recites:

> . . . the first source gas is a semiconductor source gas having a second deuterated gas concentration that is at least one volume percent; [and] the second source gas includes a gas selected from a group consisting of oxygen, ozone, nitrous oxide, and a nitrogen source gas that includes molecules consisting of nitrogen atoms and other atoms having one proton . . .

Similar to the limitation recited for the sintering gas, claim 1 is broadly written to recite the first source gas includes "... a second deuterated gas concentration ..." Such a limitation, however, cannot be read to include ozonated deuterium oxide, nor would it be obvious to one skilled in the art that such a recitation could include ozonated deuterium oxide, since there is no such disclosure in DeTar. As supported by the text of DeTar, claim 1 does not recite the second source gas as including a deuterated substance, much less ozonated deuterium oxide. Consequently, claim 1 of DeTar does not teach or suggest the limitations of claim 26 as purported by the Patent Office.

In summary, it is respectfully noted that DeTar does not teach or suggest the use of ozonated deuterium oxide in any part of the reference. Since DeTar fails to teach such a process, DeTar cannot be combined with Gardner '652 to teach the limitations of claim 26. Although Foglietti was not specifically cited as teaching the limitations of claim 26, it is noted that Foglietti also fails to teach or suggest the use of ozonated deuterium oxide to form an oxide layer. For at least these reasons, claim 26 is asserted to be patentably distinct over the cited art. In addition, dependent claims 27, 30, and 32-35 are patentably distinct from the cited art for at least the same reasons as claim 26. Accordingly, removal of this rejection is respectfully requested.

In addition to being patentably distinct for reasons noted above, at least some of the claims dependent from claim 26 are believed to be separately patentable as set forth below.

Dependent claim 27 specifies the oxide film is grown to a thickness less than or equal to approximately 10 angstroms. DeTar discloses forming oxide film 22 to a thickness of approximately **4000 angstroms** (DeTar -- col. 2, lines 38-39) and further teaches that "...

insulating layers formed using deuterated gases are at least **1000 angstroms** thick" (DeTar -- col. 3, lines 41-42 (emphasis added)). Based on such disclosure, modifying Gardner '652 to include the oxide layer formation process taught in DeTar would not produce the limitations recited in claim 27. Furthermore, the thickness range disclosed for the process described in DeTar is **vastly** different than the thickness of 5-10 angstroms noted for process layer 14 in Gardner '652. Since the objective of Gardner '652 is to form an ultra thin, reliable gate dielectric (*see*, e.g., Gardner '652 -- col. 3, lines 14-16), one skilled would not be motivated to modify Gardner '652 with the oxide layer formation process disclosed in DeTar. *See*, e.g., M.P.E.P. § 2143.01(V) ("If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.")

Dependent claim 34 specifies exposing the semiconductor topography to a liquid form of ozonated deuterium oxide. DeTar specifically discloses the use of gases for the oxide layer formation process described therein (DeTar -- col. 2, lines 39-43 and 61-63). There is absolutely no teaching or suggestion that the process may be successfully conducted using liquid reactants. Without any teaching or suggestion of such a limitation, no combination of DeTar and Gardner '652 can teach the limitations of claim 34. Although Foglietti teaches a rinsing step utilizing ozonated deionized water, such a teaching does not provide motivation to alter the deuterated gas process taught in DeTar to teach the limitations of claim 34. In particular, there is no teaching or suggestion within Foglietti that deuterated substances may be used in a liquid form to form an oxide layer.

CONCLUSION

This response constitutes a complete response to all of the issues raised in the Office Action mailed August 22, 2007. In view of the remarks herein, Applicant asserts that pending claims 6-8, 19-21, 23, 24, 26, 27, 30, and 32-35 are in condition for allowance. If the Patent Office has any questions, comments, or suggestions, the undersigned earnestly requests a telephone conference.

No fees are required for filing these amendments; however, the Commissioner is authorized to charge any additional fees, which may be required, or credit any overpayment, to Daffer McDaniel LLP Deposit Account No. 50-3268.

Respectfully submitted,

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